SCIENTIFIC AMERICAN.

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THE
SCIENTIFIC AMERICAN,
PUBLISHED EVERY THURSDAY MORNING, AT NO. 11 SPRUCE STREET, NEW YORK, NO. 12 STATE STREET, BOSTON, AND NO. 21 ARCADE, PHILADELPHIA,
(THE PRINCIPAL OFFICE BEING IN NEW YORK,)

By RUFUS PORTER.

Each number will be furnished with from two to five original engravings, many of them elegant, and illustrative of *New Inventions*, *Scientific Principles*, and *Curious Works;* and will contain, in addition to the most interesting news of passing events, general notices of the progress of Mechanical and other *Scientific Improvements;* American and Foreign Improvements and Inventions; Catalogues of American Patents; Scientific Essays, illustrative of the principles of the sciences of Mechanics, Chemistry and Architecture; useful information and instruction in various Arts and Trades; Curious Philosophical Experiments; Miscellaneous Intelligence, Music and Poetry.

This paper is especially entitled to the patronage of Mechanics and Manufacturers, being the only paper in America devoted to the interests of those classes; but is particularly useful to farmers, as it will not only apprise them of improvements in agricultural implements, but instruct them in various mechanical trades, and guard them against impositions. As a family newspaper, it will convey more useful intelligence to children and young people, than five times its cost in school instruction. Another important argument in favour of this paper, is, that it will be worth two dollars at the end of the year when the volume is complete, and will probably command that price in cash, if we may judge from the circumstance that old volumes of the New York Mechanic, by the same editor, will now command double the original cost.

TERMS.—The "Scientific American" will be furnished to subscribers at $2,00 per annum,—one dollar in advance, and the balance in six months.

Five copies will be sent to one address six months, for four dollars in advance.

Any person procuring two or more subscribers, will be entitled to a commission of 25 cents each.

The Iron Master.

BY JESSE E. DOW.

I delve in the mountain's dark recess,
And build my fires in the wilderness;
The red rock crumbles beneath my blast,
While the tall trees tremble and stand aghast;
At the midnight hour my furnace glows,
And the liquid ore in a red stream flows
Till the mountain's heart is melted down,
And seared by fire is its sylvan crown.

Old Cyclops worked in his cavern dire,
To tip the arrows of Jove with fire;
But I in my mountain crevice toil,
And make the rocks in my cauldron boil,
That man may hurl on his fiercest foes,
The iron rain and the sabre blows;
And send on the long and quivering wire
The silent thought, with a wing of fire.

I burn the woods, and I melt the hills,
While the liquid ore from the earth distills,
That over the railroad track may run,
The iron horse to outstrip the Sun;
That ponderous wheels may dash the brine,
And play with monsters of the Line;
While isles of coral seem to be,
But mile-stones placed in the deep blue sea.

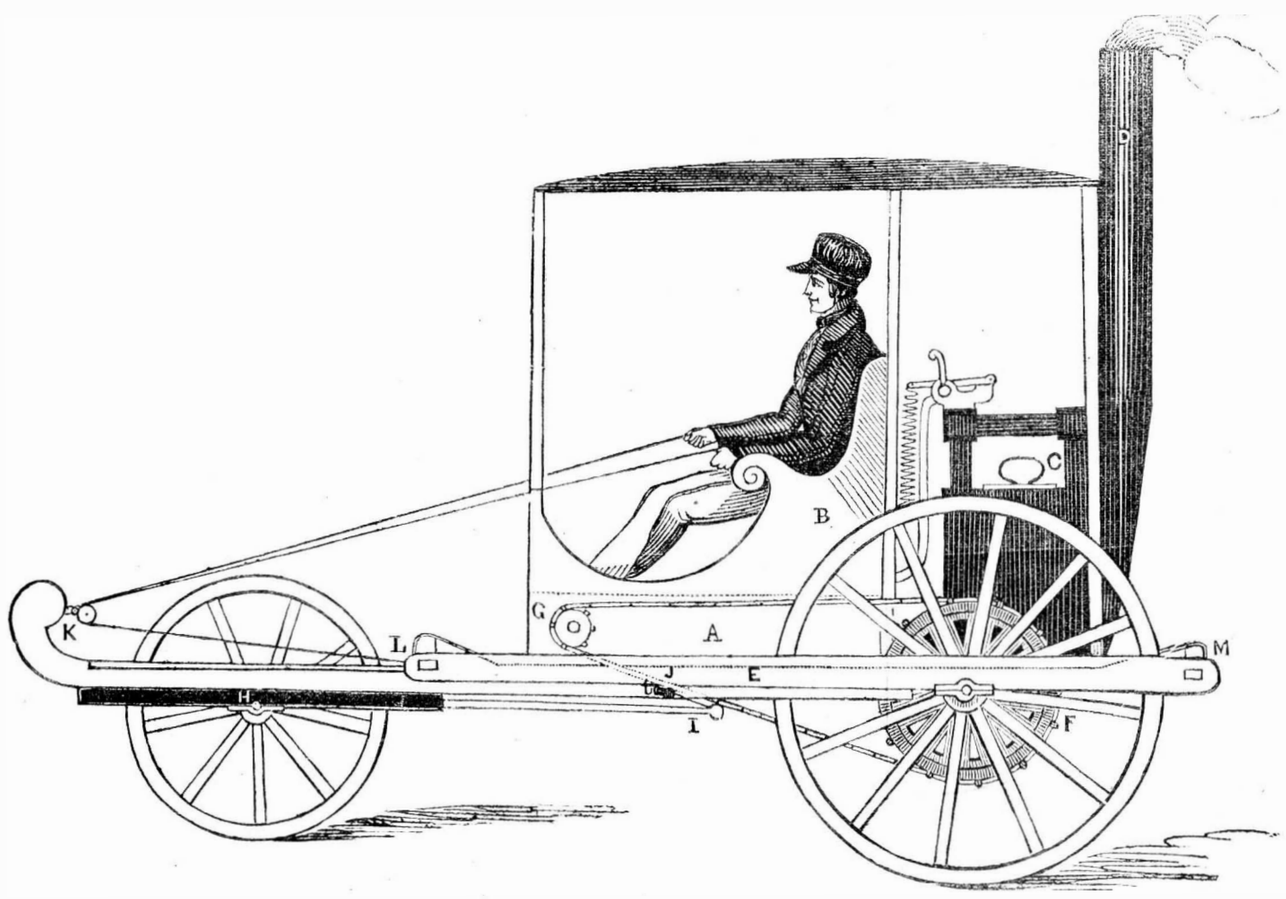
When night comes on and the storm is out,
And the rain falls merrily about,
My mountain fires with ruddier glow,
Are seen to burn by the drones below;
And as my merry men pass around,
Their shadows seem on the bright back-ground,
Each like a Vulcan huge and dire,
Forging a thunderbolt of fire.

Richer than Danæ's golden rain,
Is the wealth I send to the fertile plain;
The press that gives to the nations light;
The wheel that turns with a thousand's might;
The plough that furrows the fallowed-field;
The sickle that reaps the Harvest's yield;
Are hidden now in that shapeless *bloom*,
Which I have borne from the Cavern's gloom.

The miser may squander his golden hoard,
And the warrior fall on his bloody sword;
The iron horse may be stiff and chill,
And the wheels of a thousand mills be still;
The steamer may sink on her ocean way,
And the fire refuse on its wire to play;
With me the earth would forget to mourn,
And leap at a blast of my mountain horn.

"Honest sir," said a judge, "why do you bring such a case as this into court? Why do you not leave it to some of your honest neighbours?" "Because, your honor," said the lawyer, "we don't choose that *honest* men shall have any thing to do with it."

STEAM-CARRIAGE FOR COMMON ROADS.



THEORY.—The fact that the power of steam was not applied to the propelling of vessels or driving machinery for one hundred and fifty years after it was known and used for raising water from mines, is spoken of as an unaccountable wonder: but it is no less suprising that this power, being so well understood and in general use for doing almost all kinds of work, is not applied to propelling common carriages, hauling stone and timber, ploughing, harrowing, &c., instead of the work of horses and oxen. The only difficulties which have been encountered in the various attempts to apply steam-power to these purposes, have consisted in the excessive weight of the ordinary steam-boilers, and in regulating this power to correspond with the occasion, in cases of miry roads or ascending hills. Both of these difficulties are evaded, however, in the plan which is represented at the head of this article, and which has been satisfactorily proved by a partial but imperfect experiment. The inventor is perfectly sanguine as to the complete success of this plan, but having met with heavy losses during the recent convulsions of trade, is waiting for circumstances to enable him to bring it into general use.

EXPLANATION.—The body of the carriage, A, is about the size and capacity of those of an ordinary gig-waggon, with a convenient seat, B, for two riders; and under the seat is a box that will contain two or three bushels of coal. Behind the seat is the boiler, C, which consists principally of two rows of copper tubes, placed in a vertical position: and the two rows being parallel to each other, and ten inches apart, the fire is contained in the space between them, and is restrained from coming in contact with the tubes above the surface of the water within them: the smoke escapes by the funnel, O. A strong frame consisting of two parallel beams, E, connected by cross-bars, is made large enough to enclose the driving wheels, F, which are put in motion by an endless chain, which passes from the wheel, over the pulley, G; and the shaft of this pulley, passing through the body of the carriage, has a double crank under the floor of the carriage, and nearly under the rider's feet; and this crank is operated by two small engines, which are placed horizontally under the floor, and are operated by steam, which is conducted to them through a small pipe, from the top of the boiler. This carriage has but three wheels; and the forward or steering wheel, has its bearings in the sides of a horizontal circle, H. This horizontal circle is so constructed and mounted as to be moved rotarily on its own centre; and from the rearward side of this circle, a lever projects horizontally to I; and from the extreme end of this lever, a cord passes horizontally to the sides of the frame, near J; thence forward and over another pulley, K, and thence to the hands of the rider, where it meets another similar cord from the lever via the opposite side of the carriage. Thus by pulling one cord the steering-wheel is turned in one direction, and *vice versa*. The body of the carriage is hung on straps or braces extending from L to M, which secures the rider and machinery from any violent jolting which might otherwise be occasioned by the roughness of the roads. There is an arrangement in the machinery, which we shall describe, with an illustrative engraving, in a future number, and by which the power of the engines is applied to both driving-wheels equally and uniformly, notwithstanding the occasional excess of motion in one of the wheels, in passing corners or curves in the roads. Another peculiarity is, that the force applied, may be occasionally increased by leverage,—consequently reducing the speed,—to such an extent that one horse-power of steam will propell as great a load up-hill or otherwise, as can be drawn by six horses. One of the uses to which this carriage is intended to be applied, is to draw a plough or harrow;—lift stumps and rocks, and do other agricultural work. For ploughing, it will be requisite to have the rims of the wheels wider than for travelling, and the tire of the wheels must be furnished with teeth or projections to prevent the sliding of the wheels on the ground. The cost of this carriage, when completed, will not exceed $500. The weight of it, including the engine and machinery, with water and fuel, will not exceed 600 lbs. The speed has not been fully tested, but it will evidently run ten miles per hour on good carriage roads. The rider and manager of the carriage, is perfectly safe from any harm by explosion, and can conveniently manage the machinery, replenish the fire, and guide the carriage, at the same time. There can be no doubt of its ultimate complete success.

ADVANCE OF RAILWAY SCIENCE.—The progress of railway enterprize is not only vast but magnificent—vast in its plans, and magnificent in its results—leaping over all obstacles, joining worlds with worlds almost, and seeming likely through the remarkable desire for increased locomotion which is not unfrequently exhibited, to "put a girdle round about the earth in forty minutes."—About thirty years ago it was doubted whether locomotives could run at all upon iron railways; twenty years ago the idea of their moving at a greater speed than ten miles in the hour was scoffed at as chimerical; fifteen years ago the unexpected rate of thirty miles an hour was considered a wonder which no effort of practical science could surpass; and now a speed of nearly fifty miles an hour is in daily use, while the rate of a mile per minute is promised, and, in some special instances has actually been exceeded. It is singular that the three great feats accomplished by practical science in our own time, viz, lighting by gas, crossing the Atlantic by steam in ten days, and rapid travelling by the same motive power on railways, have one and all, been denounced as utterly impracticable by "philosophers," who actually knew nothing of the subject upon which they theorised.

A private library was lately sold in England for $85,900. The sale occupied 62 days. The library had been the property of the Duke of Sussex.

THE OLD KEYSTONE.—Some good citizen of the Old Keystone State has thrown together a lot of statistics which are abundantly cheering. It appears that Pennsylvania now produces annually 15,000.000 bushels of wheat and 46,000.000 bushels of other grain, and is capable of increasing the amount fourfold; that she will send to market this year 1,000,000 tons of anthracite coal, yielding a return to the State, of $7,000,000; that she manufactures three-fourths of the iron made in the Union, and has the means of supplying the consumption of the world; that she has a bituminous coal field, through which the main line passes for one hundred and thirty miles, containing 1,000 square miles, or 6,400,000 acres, when all Europe contains only 2,000 square miles of bituminous coal land.

VALUE OF A TEMPERANCE PAPER.—In a certain town in Connecticut, where the Youth's Temperance Advocate had been taken in the Sunday School, its discontinuance was advocated on account of expense. A poor woman said it must not be given up; and should not be, if she paid the ten dollars herself, and earned the money by washing; for, said she, I had rather do that than have the little paper discontinued, and my husband be what he was before that little paper came into my family—a miserable tipler, spending his time and money in the low porter-houses.

MINUTE OXIDATION OF POLISHED SURFACES OF METALS.—It is not generally known that a polished surface of steel or iron contains an infinitesimal quantity of oxide. This is the fact, however, as can be clearly proved by a single experiment. If a polished plate of steel be immersed in mercury, no amalgamation will take place; or if a bar of steel be suddenly broken over mercury, and immediately immersed, the metals will not unite; but if it be broken under the surface of the mercury, they will be found to have malgamated perfectly: thus clearly demonstrating that fresh surfaces of these metals are sligtly oxidized by even momentary exposure to the atmosphere. This fact was first observed by Fredrick Hassler.

SOMETHING LIKE LUXURY.—A late New Orleans paper says: We dined with a friend near the city a few day since, and the desert consisted in part, of five varieties of grapes, three of figs, water melons, musk melons, four kinds of cantelopes, peaches, apples, pears, three species of plum, pomegranates, pecans and filberts, all grown on the premises.

A SIMPLE RULE.—To ascertain the length of the day and night at any time of the year, double the time of the sun's rising, which gives the length of the night, and double the time of setting, which gives the length of the day.

CATALOGUE OF AMERICAN PATENTS ISSUED IN 1844.

[Continued.]

CLASS X.—*Land conveyance, comprising Carriages, Cars, and other vehicles used on roads, and parts thereof.*

Coupling bars of railroad car, locomotive, &c.,—William D. Chesnut, Wilmington, Del., Feb. 29th,

Turning curves on railroad—John H. Quail, Philadelphia, Feb. 25th.

Improvement in railroad car, to prevent accidents from what are called "snake heads"—Elisha Tolles, New York, Feb. 20th.

Connecting carriage-bodies with the perch by means of springs—George Nicholas, Trumbull, Ct., April 10th.

Improvement in hanging carriage bodies—John Reynolds, Newbury, Pa., July 9th.

Detatching horses from the carriage—John Madden, Warren, Ohio, July 9th.

Mode of disengaging horses from the carriage—James S. Shnell, Shiremanstown, Pa., April 13th.

Couplings for carriages, waggons, &c.—George W. Hatch, Parkman, Ohio, June 13th.

Journals of railroad cars, constructing the bearings and oil boxes, &c.—John H. Tims, Newark, N. J., reissued June 13th.

Spring-brace for carriages—Erastus T. Sprout, Dimock, Pa., Sept. 7th.

Wrought iron carriage wheels—James McCollum, Wilsonville, Ala., May 10th.

Cast iron railroad wheels—Ebenezer A. Lester, Boston, Mass., Aug. 10th.

Lining Metalic boxes for wheel hubs—Moses Palmer, Baltimore, Md., March 9th.

CLASS XI.—*Hydraulics and pneumtics, including water-wheels, windmills, and other implements operated on by air or water, or employed in raising and delivery of fluids.*

New mode of directing Ærostats or balloons, &c. Muzio Muzzi, Bologna, Italy; May 12th, 1844, France; Oct. 16th, 1844, U. S. A.

Improvement in fire engines—Gardner Barton, jr. Waterford, N. Y. Aug. 16th.

Hydro-pneumatic apparatus for raising beer, &c., from casks.—Richard Sealy, New York, Aug. 31st.

Improvement in the construction of pipes for the supply of aqueducts—John H. Thorndike, Boston, Mass., July 1st.

Pumps—T. Jefferson Wolfe, Baltimore, Md, April 10th.

Water and animal power—John A. Wiszt, Phila. May 10th.

Mode of regulating the supply of water—John Cochrane, Newark, N. J., July 13th.

Improvement in the construction of water wheels—Hiram Ferguson, Richland, N. Y., March 20th.—Nelson Johnson, Rathboneville, N. Y., March 26th—Albert Stimpson, Rockingham, Vt. April 25th.—Daniel Weaver, McKeansburg, Pa, June 10th.—David Putney, Redbank, Pa., Aug. 12th.—Roswell Cook, Elkland, Pa., Sept. 14th.—J. D. Robinson, Peoria, Ill., Oct. 24th.—Samuel L. Valentine, Bangor, Me. Dec. 12th.—Theodore R. Timby, Cato Four Corners. N. Y., Sept. 27th.

Combined water-wheel—Emerson G. Covel, Glenn's Falls, N. Y., Feb. 20th.

Current water-wheel—John Carnegay, Tully, Mo., April 10th.

Horizontal wind-wheel—Daniel Dennett, Centerville, La., Nov. 13th.

CLASS XII.—*Lever, Screw, and other mechanical power, as applied to pressing, weighing, raising and moving weights.*

Balance cranes—Claudius Gignoux, New York, assignee of Louis Henry, Paris, France, Oct. 27th. 1842, France; Nov. 9th, 1844, U. S. A.

Spring Balance—James H. and R. H. Bull, New York, Sept. 20th.

Self-acting cheese press—John Martin, jr. Atzalan, W. T., Nov. 26th.

Cotton press—Seth Lamb, New York, March 16th.—Wm. Sewell, jr. Macon, Pa., June 15th.—George Peck, Fairfield, Ct., March 9th.—Wm. F. Provost, Barnwell District, S. C. Sept. 14th.—Jedediah Prescott, Memphis, Tenn., Nov. 9th.—Peter M. Right, New York, Nov. 26th.

Hay press—Charles F. Paine, Winslow, Me., Apr. 25th.

Hay & cotton press—S. W. Bullock, Williamsburg, N. Y., March, 3, 1842; reissued Aug. 14th, 1844.

Presses—Amos Jackson, Liberty, Ill., June 24th.

Lever powers for pressing—Robert Sanderson, Athens, Ohio, Feb. 20th.

Machines for preparing tobacco for pressing—David Smith, South Hill, Va. Jan. 15th.

Machines for pressing, and raising weights—Smith Cram, New York, March 9th.

CLASS XIII—*Grinding mills and mill gearing, containing grain mills, mechanical movements, horse-power, &c.*

Bark mill for grinding tanners' bark—Mather Beecher, Remsen, N. Y., Sept. 27th.

Bolts for bolting flour—Ryburn Buchanan, Sullivan County, Tenn., July 24th.

Mill for grinding corn and cobs—Samuel L. Starr, Mexico, Pa., April 4th.

Cylindrical mill for grinding grain—Jacob Groat, Troy, N. Y., July 11th.

Mills for grinding grain—Eli B Nichols and David Marsh, Fairfield, Ct., March 13th.

Portable mill for grinding grain—Erastus Arnold, Otego, N. Y., March 9th.

Improvement in grinding mills—George T. Walters, Nicholasville, Ky., Feb. 12th.

Grist mill—John Ansel and J. Gallery, Brooklyn, N. Y., Aug. 21st.

Horse-power for driving machinery—A.D Childs, Rochester, N. Y., May 6th—Samuel B. Haines, Greensburg, Pa., April 4th.

Govenor for regulating the movements of mill wheels, &c.—Henry Burt, Boston, Mass., Aug. 31.

[To be continued.]

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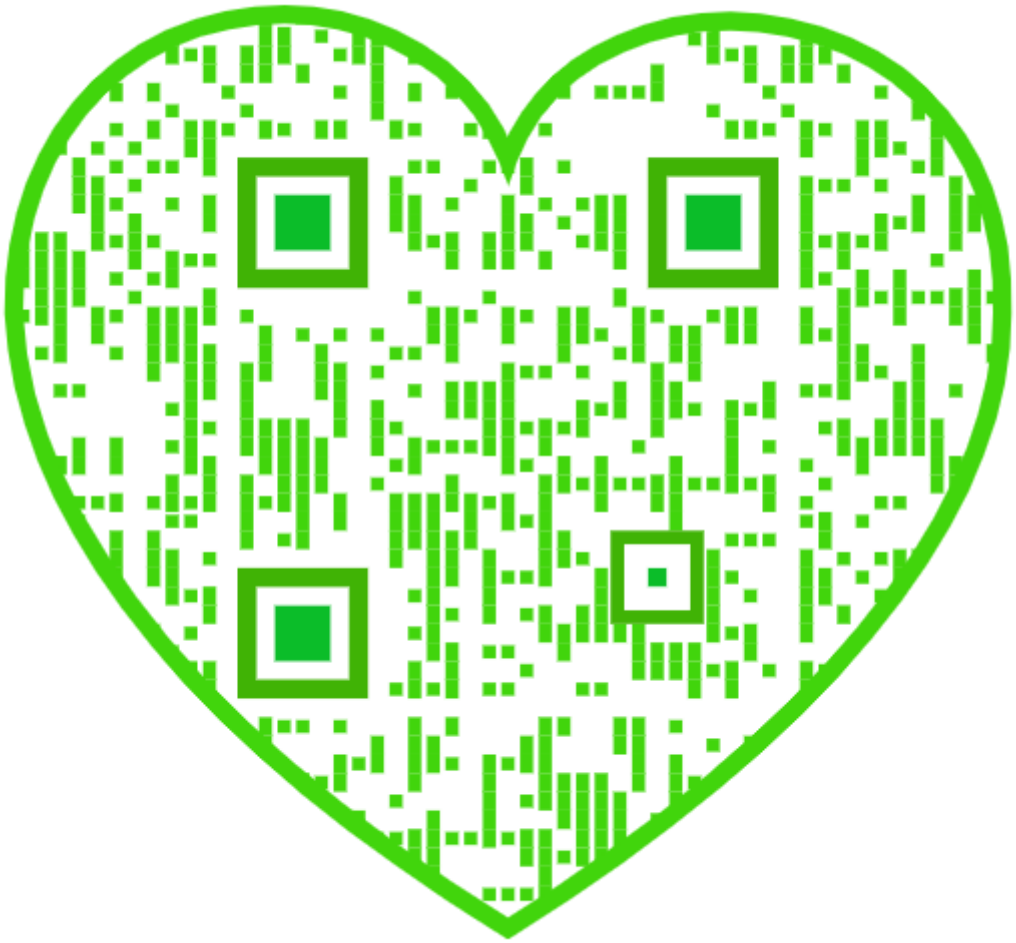
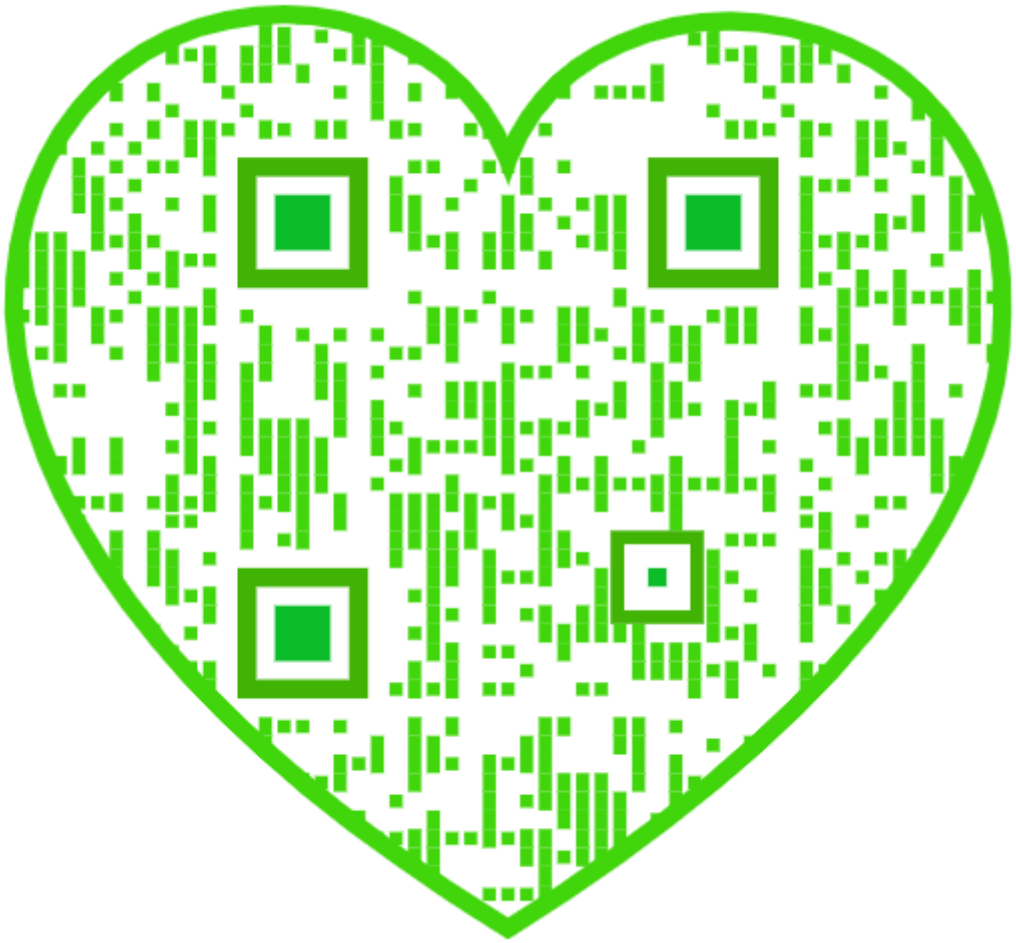




SCIENTIFIC AMERICAN

NEW-YORK, THURSDAY, OCT. 2.

SECURE THE FIRST NUMBERS.—We have a few copies of our first number remaining, and those who intend to become subscribers will do well to secure them while they may. There will soon be a pressing demand for them, when too late. We are authorized to offer fifty cents for the first number of the New York Mechanic.

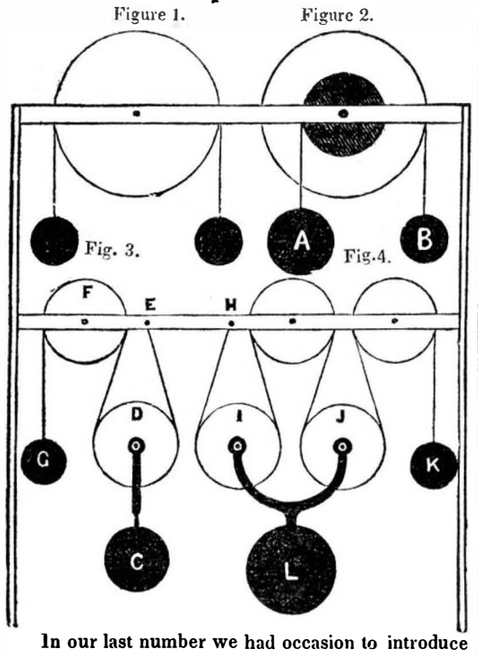
ELECTRICITY, AND MORSE'S TELEGRAPH.—We have now in course of preparation, several engravings for the illustration of Galvanism, Magnetism, Electro-magnetism, and Magneto-electricity; also a full representation of the machinery of the Electro-magnetic Telegraph.

TO CORRESPONDENTS.—We have received several communications and drawings of bridges and other improvements, which will receive due attention.

POSTMASTERS and others to whom this paper may be sent, are respectfully solicited to exhibit the same to others, that its patronage may be thus extended.

First Principles of Mechanics.

Figure 1. Figure 2.



In our last number we had occasion to introduce a single pulley, but without any explanation of the nature thereof, as an illustration of principle. The pulley is one of the many modifications of the lever: this will appear plain when it is observed that two balls suspended by a cord which passes over a pulley, as in Fignre 1, they will counterbalance each other in the same manner that the two balls do on a straight lever, as represented in the last number. The small pin in the centre of the pulley is termed the axle, and corresponds to the fulcrum which is used in connection with the straight lever. But if two pulleys are mounted on the same axle, and one of them is twice as large in diameter as the other, as in figure 2, then a ball suspended from the periphery of the large pulley will balance one of double its weight, which shall be suspended from the opposite side of the small pulley: thus the ball B has as great an influence on the pulley, as A, although it is only half as heavy; and the reason of this is, that in case of motion in the pulley, B would move with double the velocity of A:—in other words, A can not descend one inch, without raising B two inches at the same time; hence, the power is equal. On the same principle, if a wheel five feet in diameter is mounted on a shaft which is only six inches in diameter, then one lb weight suspended from the periphery of the wheel, will be sufficient to counterbalance ten lbs. suspended from the opposite side of the shaft. The ball C in figure 3, is suspended from the axle of the pulley D; and one end of the cord which sustains this pulley is made fast at E, while the other end, after passing over the pulley E, terminates at the ball G: in this case the ball G will sustain a ball of double its own weight at C. In this instance the pulley D being a lever, the fastened end of the cord, is the fulcrum; the force is received from the ball G, and is applied to the ball C: or rather, this would more strictly be the case, if G was a little more than half as heavy as C, so as to produce motion by descending. In figure 4, the cord being made fast at H, passes under two pulleys, and over two. By this arrangement, there is a *double leverage* gained in each of the pulleys I and J, so that the ball R will sustain four times its weight at L; this fact we shall illustrate by remarking, that the ball L being attached to both pulleys I and J, is suspended by a four-fold cord: so that if this ball is made to descend one inch, the length of each section of the cord, must be extended an inch, making four inches in all; and consequently the ball K will be elevated four inches; reversing the motion, the ball K must descend four inches to raise L one inch. Thus, a man hauling down the cord at K would be able to hoist four times his own weight at L; and this will sufficiently illustrate the principle of pulleys in general. The windlass, which is another modification of the lever principle, is a simple horizontal cylindrical shaft, having a pivot or axle at each end, and several holes in the sides thereof, in which are occasionally inserted a kind of wooden bars called hand spikes, and by means of which the shaft is turned. A powerful draught is thus produced on a rope or chain attached to the shaft, and winding round it. The capstan, is a vertical windlass having a projecting circular head, in the periphery of which the hand spikes are inserted, and by which the capstan is made to revolve; the operators walking round in a circle. In our next number we shall introduce the Inclined-plane, Wedge, Screw and Toggle; and endeavour to show that they are all but so many modifications of the *lever principle.*

On the Resistance of Fluids.

The weight of a cubic foot of water, is about 62 lbs. To put this quantity in motion equal to 16 feet per second, requires a power equal to that required to raise the same quantity four feet perpendicularly; or about equal to 5-6th of one horse-power. To produce a continuous current of water with the same velocity through a channel one foot square, would require sixteen times as much power, because the quantity thus put in motion, would be sixteen cubic feet per second instead of one foot. If the paddle-wheel of a steamboat be 16 feet in circumference, with paddle-boards or buckets one foot square; and if the paddle-boards are made to pass through a channel, so constructed that the water cannot escape in but one direction, then the power required to put the wheel in motion, of one revolution per second, would be 16 5-8—ten horse-powers. This is on the supposition that the *boat* remains at rest; but if the boat should be moving with a velocity of eight feet per second, and in a direction contrary to that of the current produced by the wheel, then only 2 1-2 horse-powers would be required to maintain the rotary motion of the wheel; for in this case, the velocity of the water would be only eight feet per second; and by the reduction of the velocity one half, the requisite power is reduced three fourths.---But if the boat moves 16 feet per second, no less than 80 horse-powers will be required to produce and maintain a current of equal velocity, because, in the first instance, as above stated, ten horse-powers are required to give that motion to 16 cubic feet of water per second; and in the second place, in consequence of the forward motion of the boat, the wheel must encounter and put in motion double the quantity of water, or 52 feet per second. In the third place, to produce this effect, the wheel must be driven with double velocity, rotarily; and, in the fourth place, to produce this double velocity of the wheel, four fold power is required, even if the quantity of water and consequent resistance were not increased. To give the wheel and consequently the current a velocity of 32 feet per second, while the boat remains at rest, would require 80 horse powers; because, first, the quantity of water put in motion, is double to that of the first mentioned, which would increase the requisite power from 10 to 20 horse powers, even if the resistance of each specific quantity of water was not increased; but as the velocity of the water is double, and to produce double the motion, requires quadruple power, the 20 horse powers must be multiplied by 4, which shows a requisite of 80 horse powers. Again, if the boat is of such a size and form that 2 1-2 horse powers will give it a motion of 8 feet per second, at the same time that a current of equal velocity is produced in the water, then to double the speed of the boat, will require 16 times as much, or 40 horse powers; because, first, each specific quantity of water must receive double velocity, which will require four fold, or ten horse powers; and second, the quantity of water thus put in motion is quadrupled—being doubled *first by* the increased velocity of the water, and again, by the forward motion of the boat. And this 16 fold power is actually required, in order to double the speed of the boat: first, because the resistance of the water against the bows is quadrupled; and second, because the motion of the wheel is quadrupled, first, by the increased motion of the paddles in, and with the current of water, and again by the forward motion of the boat by which the axle of the wheel being moved in a direction contrary to that of the paddles, a more rapid rotary motion becomes necessary. Moreover, if the paddles of the wheel have not an artificial channel or flume, to prevent the escape of the water from before the paddle, but merely dip in the free and unconfined water of the ocean, then an additional increase of power will be required to counterbalance the deficiency of resistance of the water, and the consequent requisite additional motion of the wheel; and this circumstance will increase the requisite to nearly 60 horse powers or 24 times as much as would be required to maintain a speed of 8 feet per second, as before mentioned. To double the speed again, or increase it to 30 feet per second would again require a 24 fold power, or 576 times as much as that required for the velocity of 8 feet per second. These statements will explain the mysterious difficulty of increasing the speed of steam boats, to any great extent, beyond that of ordinary boats.

TOO ATTRACTIVE.---We have heard of a country where the mice were so plenty that the inhabitants were compelled to supply them with large quantities of provisions, to keep them from devouring the food placed on the tables for the people: and we are much inclined to the opinion, that our only method of securing the safe-conveyance of our paper to subscribers, and especially to exchanging cotemporaries, is to send extras enough to supply all the post-office clerks in the country. We can assure our friends who have sent their papers in exchange, that ours has been promptly sent,---carefully enveloped and directed,---from the commencement: yet we learn with regret, that only a part of them reach their destination. If editors will inform us, by mail or otherwise, what numbers of the Scientific American are missing, we will immediately send them. Our custom is to send duplicate copies to all who insert our advertisement, although our exchange list is already much larger than we can afford to continue.

WAKE UP.---Before we commenced the publication of this paper, we were encouraged to proceed by having a respectable number of names sent as subscribers, ordering the paper when published. Most of these have promptly paid according to agreement: but we must remind the *few* who have thus far neglected their engagement in this respect, that since they encouraged us to incur the responsibility of the publication, it will be no less than *meanness* for them to neglect to fulfil their engagement. With this view we shall publish the names of delinquents, who reside within 500 miles, unless we hear from them soon.

A company in Manchester, N. H., are making arrangements for the extension of Morse's telegraph from Lowell to that place.

Ærial Navigation.

ATMOSPHERIC RESISTANCE.—We shall now indeavour to show the practicability of propelling a balloon of the dimensions specified in a former number, with the proposed velocity of 100 miles per hour, independently of any atmospheric current. The atmospheric resistance presented to a plain surface, as the end of a cylinder, while passing through the air with a velocity of 100 miles per hour, is according to Dr. Arnot, and nearly according with some experiments of our own, about three pounds per square foot. On this calculation the atmospheric resistance against the end of a cylinder 35 feet in Diameter, while moving with a velocity of 100 miles per hour, would be about 3000 pounds, and would require 1600 horse power to propel it. What constitutes this atmospheric resistance, is the inertia of the air, 1000 cubic feet of which, must be put into as rapid a motion as that of the cylinder during each foot of the progress thereof. And if the length of the cylinder is equal to that of the proposed balloon, —350 feet,—then in moving half its length, or 175 feet, 175,000 cubic feet of atmospheric air must be put into this rapid motion during this portion of its progress. With the eliptical or revoloidal spindle form, the case is different: for although an equal quantity of air must be displaced during an equal progress of the balloon, yet the motion of the air being comparatively moderate, the resistance of inertia is less. It will be seen that at and near the point of the balloon, where the surface forms the greatest angle with the direction of its motion, the diameter is small, and consequently, but a small portion of surface encounters atmospheric resistance, in that section: but where the diameter and surface are larger, the angle is less, and the resistance is less in proportion to the surface. The greatest resistance may be therefore supposed to be at about 160 feet from the point, at which place the circumferance of the balloon is about 80 feet. The angle between the surface and the direction of motion at this point is about 5 degrees, or about one foot rise to fifteen feet in length. Then if the balloon is moving, as supposed, nearly 150 feet per second, the motion of the displaced air is about 10 feet per second, and its resistance will be about one fourth of an ounce per square foot. And as the surface of the first half of the balloon is about 10,000 square feet, we may estimate the resistance at 156 lbs. But it must be observed that this resistance is not directly against the motion of the balloon, but only obliquily as it presses on the surface: and the average angle or inclination on which it presses, being as about one to fifteen, the actual resistance is reduced to about ten lbs. Therefore, as 10 horse powers are sufficient to drive a resistance of 33 lbs., 150 feet per second, it is a reasonable conclusion that the difference between 33 lbs. force and 10 lbs. resistance, is sufficient to balance the loss of power by the imperfect resistance of the air against the fans of the spiral fan-wheel. These calculations have not been drawn with mathematical accuracy, because our limits would not admit of it: but we have kept on the liberal side of the estimates, and if we have fallen into any material errors, shall be glad to be corrected.

Railroad Intelligence.

The prospect of the St. Lawrence and Atlantic Railroad, otherwise called the Montreal and Portland road, appears very favourable: $3,500,000 have been subscribed to the stock, and that of the Canada section is quoted in England, at 1¼ per cent premium. The people of Maine are wide awake on the subject. The railroad from Boston to Canada, via Concord, Lebanon, Sherbrook, and Stanstead, is also progressing. The stock is already taken up for that section of the route between Lebanon and the Pausumpsic river. This is called the Central Route, and has been expected to connect with the Cheshire road, which is an extension of the Fitchburg railroad, through Keene, N. H., and Rutland, Vt. But it is now decided to extend the two roads without connection. The contracts are already made for the Cheshire road from Keene to Bellows Falls.

The Harlem Railroad Company have decided to extend their road twenty-four miles further, to a point near the Connecticut line. They have advertised for proposals for grading, &c.

The Morris and Essex Railroad Company have resolved to extend their road to Dover,—a place situated in the midst of the iron regions of New Jersey.

DAGUERREOTYPES.—Some important advances are made in this art, although it has not been improved so rapidly as we had hoped on its introduction. We have recently been shown a very perfect photograghic picture, taken by an amateur in Boston, in which the view is presented in its right position, instead of being reversed, as in the ordinary views. Some have also succeeded in taking views on a large scale, full length portraits, &c., without any perceptible disproportion. But when a method is discovered of etching the plates deep enough to print from them, giving fair impressions on paper, we shall feel more perfectly satisfied with the art than at present.

MECHANICS IN RUSSIA.—Between 3,000 and 4,000 people, consisting of Americans, English, Scotch, Irish, and Germans, are employed in the gigantic locomotive establishment recently put in operation in Russia, for the construction of locomotives for the great chain of Russian railroads. This large concern is under the direction of Maj. Whistler, recently from Lowell, Mass. A military guard s kept on duty to preserve order.

A GREAT WORK COMPLETED.—The whole line of railroad from Cincinnati to Lake Erie has been opened, and it is said that goods may now be transported from New York to Cincinnati by the Lake route in 16 days. This speaks well for the enterprise of the West.

The Art of Painting.

(Continued from No. 5.)

COMPOUNDING COLOURS.—White is considered as not only a principal colour in painting, but the base or foundation of all light coloured paints. White lead is the principal white in use, though a more delicate white called *flake white*, is used in ornamental work. Several common colours, known as lead-colour, slate-colour, &c., are produced by mixing lamp-black with white lead in different proportions. A small quantity of Prussian blue, finely ground and added to white lead, constitutes the common *sky-blue.* Minute quantities of blue and yellow added to white, produce the delicate *pearl-colour*, so much in vogue for parlours and halls. Straw colour is produced by the addition of a little chrome yellow to white: and pea green by the addition of Paris green. A beautiful light purple, or peach-blossom colour is produced, by adding to white lead, small quantities of ultramarine blue, and drop lake. It is needless to specify the exact proportions of the ingredients in these compounds; the only rule being to add the colouring ingredients in minute quantities, till the required colour is produced. The most common colour for floors, is composed of white lead and yellow ochre, in about equal quantities by weight, with the addition of one ounce of red lead to each pound of the mixture. In painting carriages or ships, a great variety of compound colours are used, a few of which may be here noticed. The best black is composed of lamp-black and Prussian blue. A dark green consists of a mixture of chrome green and Prussian blue. A brilliant *plumb colour* is produced by a mixture of lamp-black and vermillion. Olive colour is produced by mixing lamp-black and chrome yellow. A brilliant orange colour is produced by mixing chrome yellow and orange lead—(a pigment similar to red lead, but more refined.) A stone brown is composed of lamp-black, yellow ochre and Venetian red, equal parts: the addition of white to this compound reduces this colour to a drab, or light stone colour. A mixture of lamp-black with Venetian red, constitutes the *chocolate colour.* A bright rose colour, which is much used in ornamenting, is composed of white lead and drop-lake. As a general rule, the colours should be mixed with oil and ground separately, before being compounded, or mixed together; but should not be diluted any more than is required for grinding, until the colour is perfected. We shall proceed with some instruction in carriage painting in our next number.

OUR INLAND NAVIGATION.—Much admiration was excited in Liverpool, Eng. a few weeks since, by the appearance of the ship Muskingum, direct from Marietta, Ohio, "seventeen hundred miles from salt-water," as the Englishmen reported. This circumstance led to an estimate of the distance, or length and extent of a voyage from Pittsburg on the Ohio, to N. Orleans; thence to the Yellowstone river, and back to Pittsburg. The distances given are as follows: Pittsburg to Cincinnati 498 miles: Louisville 137: Mouth of the Ohio 435: New Orleans 1012: St. Louis 1184: Weston 500: Yellow Stone 1348: back to St. Louis 1848: Mouth of the Ohio 172: Pittsburg 980. Making a voyage of 8024 miles, without going in sight of salt water. Well may Englishmen admire our facilities for inland navigation.

WORTHY OF IMITATION.—A young gentleman who has recently visited Easton, Pa., reports that in strolling in the neighbourhood, he entered the extensive Tannery of Anthony Macoy, Esq., and that though an entire stranger, he was received with much civility and good-nature on the part of the proprietor, who in addition to showing him his works, gave him an instructive lecture explanatory of the principles of tanning. Such conduct, so different from the gruff and morose manner of most of the bosses in manufacturing establishments, is sure to gain the respect and good-will of acquaintances, and prove decidedly advantageous in the course of business.

LOCK MANUFACTORY.---There is an establishment in New Haven in which fifty hands are employed in the manufacture of door-locks, latches and knobs, of all sizes and patterns. The aggregate of wages paid to the workmen, is about $20,000 per annum. No less than 120,000 of the kind called *mineral knobs* are made per annum, besides immense numbers of locks varying in price from $5 to $50 per dozen, and in nine different styles. Establishments of this kind support the farmers much better than sending their produce to Europe to exchange for these articles of useful hard-ware.

CHEAP TRAVELLING.—The competition among the steamboats on Lake Champlain has been so great recently, that the owners not only carry passengers for nothing, and board them, but pay their bills at the hotels. One of the agents, a few days since, paid the hotel bills of several gentlemen, amounting in all to $112, and then carried them free. This conduct being thought rather *too* generous, however, a subscription was put forward, which amounted to $160, but without any influence on the part of the owners or agent.

MIRACULOUS SPEED.—The result of the Sunderland election was looked for with so much interest in London, that the Times ran an express. The distance by railroad was 303 miles, which was accomplished by the special engines in seven hours and thirty minutes. The journey from Darlington to York, 45 miles, was performed in fifty-two minutes, and in some parts of the line, the train was proceeding at the almost incredible speed of a mile in 48 seconds—at the rate of 75 miles an hour!

LENGTH AND HEIGHT.---"The steamer Oregon," says the N. Y. Sun, "if placed on end, would be fifty feet higher than the cross on Trinity Church." The Oregon is 330 feet long, and of course the Trinity Church spire is 280 feet high. But few people would judge from the appearance of the two, however, that the length of the steamer was equal to the height of the church spire.

VARIETY

Some of the phrenological editors of the city, have examined the orang outang, now being exhibited at the American Museum, and pronounce it quite equal to the lower classes of humanity.

A gentleman who has resided in Paris, France, eighteen months, says that in all that time he saw but one fire, and heard but one alarm. He was probably accustomed to sleep very sound.

The beautiful College Green at New Haven is about to be improved by a substantial and elegant iron fence, with double rails and lattice-work, and hewn granite posts.

During a recent storm in Washington, a spark of lightning passed down the chimney to the cellar, of the house of Mons. Pageot, and broke several dozen bottles of choice wine.

Several manufacturers at Waterbury, Ct., are engaged in making small coin for the Hatien Government. They have a contract for six tons of one kind. rather less than a half cent.

Measures are in progress for the survey of a railroad from Salem, Mass., to Andover, to intersect with the Boston and Maine railroad, and shorten the route to Lowell.

Books have been opened for a telegraphic communication between Boston and Portland, with the privilege of extending the same to Brunswick, Bath and Bangor.

Ten years ago the expenditures of the State of Indiana averaged about 12 cents to each person. The debt is now $12,000,000, her taxes high, and the interest of her bonds not paid.

The new locomotive, "Boston," now running on the Long Island railroad, performs the whole distance —96 miles—with a full train, in less than three hours, and runs moderately at that.

A new furnace has been put in operation, in Hamden Co., Ill., for the production of lead, which yields from 65 to 86 per cent. The mines are very extentive.

A contempory complains that there are 30 thousand persons in the United States, of the name of John Smith, and recommends the transportation of all but 5,000 of them.

The new steam factory building, at Portsmouth, N. H., is to be 200 feet long, 70 wide, and six stories high. It is in progress and expected to be completed this season.

Rev. J. N. Maffit is said to be preaching successfully at Toronto, C. W.; but whether he is preaching Methodism, or Odd-fellowism, we are not informed.

A bald eagle was shot at Compton, R. I., by one of the Boston sportsmen, last week. He measured six feet four inches from tip to tip, and was very ferocious.

A boy was lately caught in the act of stealing a political newspaper from the door of a subscriber, and by way of punishment, he was compelled to stop and read it. He will not take another.

A woman in Frankfort, Ky., having broken off the point of a needle in the palm of her hand, a magnet was bound on the place, and in a short time it drew out the needle.

In Manchester, N. H., containing a population of 6000 inhabitants, there is no place at which intoxicating liquors can be obtained in any quantity, at any price. This town *must* prosper.

One feature proposed in the new constitution of Texas, is that any citizen of the state may hold a farm of a certain size, free from all claims and legal process.

A young man only 20 years old, in Oswego Co., has been convicted of marrying too many wives. His name is Ketchum, (or Catch-'em) which in a measure accounts for it.

Some thief has stolen a coat from a Cincinnati editor; the thief is known, but the editor cannot expose him lest he should expose the *coat* also.

The Abington Virginian speaks of a section of the country where the grass is so short that the farmers have to lather it before it can be mown.

The Picayune says that the Yankees near Boston are constructing flat bottom boats, for the purpose of running over the bars and shoals of Texas.

The steamship Bangor, at the time of her destruction by fire, had on board 150 barrels of alcoholic liquors, as part of the freight.

The result of the new census of Brooklyn shows the population to be 60,000, being an increase of upwards of 23,000 within five years.

It is expected that the line of magnetic telegraph between Philadelphia and Baltimore, will be put in operation by the middle of October.

It is contemplated to construct a bridge over the Niagara at the whirlpool, a short distance from the falls. The length of the span will be 332 feet.

A correspondent of the London Miners Journal asserts that he has recently written on paper made entirely of iron. No great improvement.

An exchange refers its readers to the advertisement of Mr. *Stillwagon*, (still wag on) who appears to be a very persevering man, and an excellent artist.

A lady in Philadelphia has been held to bail in the sum of $1000 for breaking open and destroying a letter directed to a young man of her acquaintance.

A Pennsylvania State Senator has been fined $300 for whipping the deputy Attorney General. Those children should be taken care of

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Freedom's Lyre.

BY MRS. MARY H. MAXWELL.

Attune the cords of freedom's lyre,
To bounding notes of glee;
And swell upon each burning wire,
The anthems of the free!
Srrike! strike again the notes of old,
That swept these hills along!
Where freedom's sons her flag unrolled,
And shouted freedom's song!

Wake! wake the tones of victory now,
For freedom's heart beats high,
And triumph sits on manhood's brow,
And speaks from woman's eye.
The sun that rose in cloud and gloom,
Now beams in radiance bright;
And in meridian splendour soon
Shall blaze with freedom's light.

When slavery's night shall pass away,
And wide o'er land and sea
Again on every breeze shall play
The banner of the free,
Then tune the lyre—let music sweep
Our hills and vales along!
While ocean's waves in gladness leap,
And dance to freedom's song.

The Drunkard's Dream.

I saw, with seemly waking eyes,
And a strange and strong reality,
My wife in her dying agonies,
And a fiend with a face replete with glee
Bending over her wasted frame,
Calling her, mocking by her name.
Anon he spoke—"Oh, oh," said he,
"A husband drunk as drunk can be!
Bite at the bosom, starvelling young:
Thy father is drunk, thy mother is dead;
Live to be doomed, live to be hung—
A pauper, a felon, but die in no bed."

I saw my eldest born in rags,
A quiet, silent boy was he;
But his was not the soul that drags
Days tainted by life's leprosy.
Proud in his youth with life well spent,
Sad in his hopes to tatters rent,
A bosom bursting with shame's dismay,
Blasting the bud of his promising May.

I saw, and how my soul shook then,
My daughter, (my joy, my pride,
Ere I had turned to a pestilential den
My home and its fireside;)
I saw her, my fair and delicate child—
Yes, once she was delicate and fair,
Meek and lowly, gentle and mild,
And ever with softest speech to spare;
I saw her with front brazen and bold,
Bloated and broken ere she was old;
And looks I saw from her once chaste eyes,
And words I heard from her lips once pure,
Telling abroad her infamy,
And I shrieked with pain beyond endure!
And then I saw a younger frame;
My fair hair'd Alfred, he was there;
I remember the time when he nightly came
To my feet, and murmur'd his little prayer!
And Tom, with his face of innocent mirth,
And his voice of cheerful, chirping glee;
And Will, who lit up our evening hearth
With his flashes of infant jollity;
And George, a smiling and gentle boy,
Who lived in a quiet gush of joy;
And they were gaol-birds, with sadden'd faces,
Cursing and railing, without a gleam,
A ray of thought in all their traces!
Trembling I woke,
And trembling spoke,
"Thank God! 'twas but a Drunkard's Dream!"

A Double Conversion.---A Jewish youth, being a medical student, at Berlin, formed an acquaintance with a young lady of the Protestant church, and a mutual attachment ensued, notwithstanding that their different religions formed an insurmountable obstacle to their union. Business called the youth to Brislan, from whence he wrote to inform the lady that the obstacle to their marriage had been removed, as he had become a Christian. But soon after this letter was despatched, he received one from the lady informing him that the obstacle to their union had been removed, as she had become a Jewess. How they managed to escape this new dilemma, report does not say.

A Sensible Remark.—"The most contemptible position," says the Indiana Journal, "in which an editor can place himself, is becoming the *blow-pipe* of the would-be-great men of the country; and it has so frequently been done that such men begin to look upon newspapers as being published for no other purpose than to show *their greatness.*

A Singing Jury.—A jury which had been confined in the second story of the Globe Hotel, Philadelphia, from Saturday until Monday of last week, and not being able to agree on anything else, fell to singing with great glee, thus surprising and amusing the people, and awakening the echoes of the neighbourhood.

Retraction.—Captain S. speaking of his superior officer, remarked that he "was not fit to carry swill to the pigs." The superior being offended, Capt. S. readily retracted by admitting that his superior "*was* fit to carry swill, &c."

The war with Mexico has blown over for the present. The Mexicans are not ready to fight.

Illustrations of Chemistry.

(Continued from No. 5.)

The Gases.—There are several kinds of substances, which are not known to exist uncombined, except in a gaseous state. Of these the most common are oxygen, hydrogen and nitrogen. There are also several kinds of gases, composed of one or more of the above, united with other bodies; of these are the carobonic acid gas, muriatic acid gas, and the nitrous oxyde, or exhilerating gas, with many others. Oxygen readily combines with some of the metals, forming what is termed oxydes. The common rust of iron, is an oxyde of that metal. All the pigments and mineral colours used by painters, are oxydes of different kinds of metals, though sometimes combined with other materials. All oxydes are much heavier than the metals on which they are based. Oxygen supports combustion, and readily unites with combustibles, forming ashes or compound gases. Combined with hydrogen, in the proportion of 85 to 15, it forms water; and combined or rather mixed with nitrogen and carbon, in the proportion of 22 parts oxygen, 77 of nitrogen, and 1 of carbon, it forms atmospheric air. Pure oxygen gas may be readily procured by decomposing any of the substances which contain its base. It is an essential constituent, and is supposed to constitute the acidifying principle of all acids; and its presence is essential to vegetable and animal life.

Experiments.—Heat a piece of common lead to a red heat, and expose it while hot to a current of atmospberic air;—The oxygen of the air will combine with the lead, and it will become red lead; and will be found to be much heavier than the original.

Place a little red lead on a piece of charcoal, and force the flame of a lamp upon it, by a blow pipe, and the oxygen will combine with the charcoal, forming carbonic acid gas, and the lead will be restored to its metalic state.

Place a little red lead in a phial, and add a few drops of sulphuric acid, and apply a flame of a lamp to the bottom of the phial, and oxygen gas will be liberated, and rise through the neck of the phial.

Burn a little sulphur (brimstone) in open air, and hold a piece of wet cloth over the vapor which rises from it;—the moisture of the cloth will immediately become sharply acidulated to the taste, being a real sulphurous acid.

Place a lighted candle or taper in a bottle containing oxygen gas, and the combustion and flame will become exceedingly brilliant.

Place a fire fly in a phial of oxygen gas, and it will appear exceedingly animated and lively, and its illumination will be much more brilliant, than when in common air.

(To be continued.)

The Mormon Persecution.—There must exist a horrid state of society in some parts of Illinois. Over one hundred dwellings have been burned by lawless mobs, because the tenants were supposed to be fanatics. Though it is well known that Mormonism is a groundless heresy, it is not likely that their persecutors have any regard for principle nor religion of any kind; and would as readily persecute and destroy the Baptists, if they were equally unpopular, as they do the Mormons. It is plain that the Government of that State has but little authority over the people.

Still later.—Since the above was in type, we have learned that about fifty more dwellings have been burned by organized bands in open day. We add no comments.

California.—Several papers are speaking in high praise of the land, climate and population of California, as if its annexation to the United States was actually anticipated. It is said to be as fine a country as Kentucky, with a milder climate, and plenty of well-wooded streams. The inhabitants are of the purest white race from the north of Spain, descendants of the Goths, and akin to the Saxon, and particularly friendly to the Anglo-Americans.

The Fourier Associations.—We have often expressed the opinion that these associations, based as they were on the integrity and rationality, not to say moral philosophy of their members, could not long hold together. There is no principle but that of divine christianity, based on the Gospel faith, capable of holding a community in mutual confidence and satisfaction. The reports of difficulties, disagreements and breaking up of several of the Fourier associations in various places, are no more than was rationally to be expected.

The Farmington Canal.---A survey is being made for a railroad on the banks of this canal, and the report thus far is exceedingly favourable. The company would have done better if it had moved earlier in this enterprise, and before the other railroad to North Hampton had been projected. But as it is, if a road on this route should be granted and constructed, it will hold a fair competition with the other roads. We should hope they will fill up the canal, road or no road, that the land it occupies may be improved for pasturage, if nothing more.

Gold in Reserve.—The richest gold mine in the world is in the town of Casola in Mexico. The proprietor, Signor Yriarte, refuses to work it, because he has already more money than he knows how to invest or improve, and therefore concludes that this treasure is safest under ground.

Ingenious Device.—A man having lost his watch in a theatre at Paris, proclaimed his loss in a loud voice, just before nine o'clock, saying that the watch would immediately strike the hour. The thief who had got it, was terrified at this, and by endeavoring to escape, was detected.

Cheap Land.—The Kalamazoo Gazette say that forty acres of excellent land may be bought for fifteen dollars, at the Land Office in Marshall, Mich. This appears to be the smallest quantity that can be bought at this office, but thousands of acres may be had at the same rate.

New Inventions.

Self acting Helm, or an Artificial Helmsman, for Steering Vessels.—Incredible as it may appear to our sceptical readers, it is nevertheless a fact that an apparatus has been invented on rational principles, that will guide a ship to any required point of the compass, without any attention from the mariners on board. This is effected by means of an electro magnetic engine, which is connected with the rudder and operates forward or reverse according to the circuit connections with the battery: and these connections are formed, pro or con, by the least variation of the needle of the compas, from the required relative position. We shall procure an engraving illustrative of this invention, in a few days, and then give a more particular description.

A New Pump.—An improved pump has been introduced in Indiana, which is said to avoid the friction to which ordinary pumps are exposed, in raising sandy or muddy water from mines. As usual, the inventor declines giving a full description of the pump, because it is not yet patented. We think this a mistaken policy of inventors, however. The most ready and effectual method of securing an invention in this country, is to pnblish the description forthwith, with the name of the inventor. This course at once secures the inventor against all pretended claims of others, although the invention should not be patented for a year afterward.

Pedestrian Car.—Mr. Hiram Tyler, of Worcester, Mass., has constructed a carriage for travelling on common roads, by hand power. The carriage runs on three wheels, and weighs but fifty pounds, although made entirely of iron. The rider propels the carriage by means of a crank, which is connected by machinery to the wheels, which are nearly four feet in diameter; and travels rapidly on a hard level road. There have been several similar carriages constructed at different times by different inventors; but this is evidently an improvement and may be useful as well as curious.

A Paging Machine.—A machine which occupies a space of less than three square feet, is so constructed as to number the pages of a book, whether bound or unbound, progressively from 1 to 10000; the simple movement of a lever, performing the combined operations of taking and distributing ink, transferring the same to the figures, making the impression, and changing the figures to the succeeding number; and is equally applicable to the numbering of railroad tickets. The invention has been patented in England by W. Shaw of Liverpool.

Improved Fire Engine.---Mr. E. Mars, of this city, has secured a patent for an important improvement in the fire engine. By means of a crank-screw the engine is raised from the ground, and the wheels serve as fly-wheels; and by means of ropes attached to these, one hundred or more persons may aid in working the engine. A machine of this plan is in progress, and will soon be ready for operation.

The Gulf Stream.—The current of the Gulf Stream has generally been attributed to the waters of the Mississippi, especially as it was observed that the water of the stream was several degrees warmer than that of the ocean in its vicinity; and although this reason was very unsatisfactory to every geography-reading schoolboy, yet no better or more rational theory was discovered till recently. It has been often shown, and satisfactorily proved that the waters of the Pacific Ocean were several feet higher than those of the Atlantic; and this circumstance has been mentioned as an objection to cutting a ship canal across the Isthmus of Darien. But it now appears evident that the water of the Pacific flows by a subterranean channel to the Atlantic, and that to this current is to be attributed the phenomenon of the Gulf Stream. Since this theory was broached—which was first suggested by Capt. Tillou, an old and experienced ship master of this city,—the idea that the Mississippi should produce such a current in the ocean, appears decidedly ridiculous. The high temperature of the water of the Gulf Stream is now readily accounted for by a knowledge of the fact that the temperature of the earth is much higher at a distance below, than at its surface: and if this subterranean channel is three or four thousand feet deep, it must pass through earth, the temperature of which is far above the boiling point of water, This theory will probably be confirmed by future observations.

The "Iron City," of Pittsburgh, came to hand last week with a countenance so decidedly pale that we could not read the outside. Whether it had been frightened by the great *turn-out* of the factory girls, is matter of conjecture. It is generally a bold and excellent paper.

A Monster Bird.--The Keosauque Times speaks of a pelican which had been recently shot in that vicinity and measured eight feet and ten inches from the tip of one wing to that of the other, and five feet four inches in length. The beak alone measured eighteen inches.

Galvanized Houses.---Contracts have been made in England for the construction of a large number of dwelling houses, of galvanized iron, for the West Indies, Central America, Peru and Chili. What constitutes the galvinization of the iron, is its being washed with zinc to prevent rust.

Altering the Law.---A printer's wife in Germany, took an opportunity of going into the printing office one night, while a new edition of the bible was being printed, and altered a word in Gen. iii. 16---"and he shall be thy lord," so as to make it read, "and he shall be thy fool."

A Good Reason.—A paper which had been mailed to a fair subscriber, was lately returned to the publisher with the endorsement "*Not taken out—she's ran away and married.*" The editor says the excuse is perfectly satisfactory.

Mammoth Cave.

[Concluded from No. 5.]

The cave, which here commences to grow wider and higher, also becomes more rough and rugged, until reaching the "Rocky Mountains," a succession of high hills, formed of detached fragments of rock, at times rising to the height of one hundred feet. The last and highest of the "mountains," upon the side that overlooks "Dismal Hollow," is two hundred feet from its summit to the level of the cave beyond. Truly, this "dismal hollow" is well deserving of its name. From the top of the mountain it appears like a bottomless gulf. The abyss covers an area of eight acres, and its depth cannot be seen, for want of sufficient light.

In "Serena's Arbor," which we entered after climbing over rocks, for some distance, are many beautiful formations of crystalized limestone. Among them are two stalagmites, worthy of notice. One of them is a representation of a cedar tree, and is perfectly correct in shape and proportion; the other is a miniature of the celebrated "Cleopatra's Needle."

A pit, one hundred and sixty feet deep, terminates this avenue, at the distance of thirteen miles from the mouth of the cave. There are other avenues or branches equally wonderful with the one described. Indeed, the cave as far as explored seems to be but one of the several caves of equal grandeur and extent, one lying above another. The branches leading from the main cave, as already discovered, are two hundred and sixty-five in number, of which there are many extensive ones unexplored. The shortest of these is one-fourth of a mile, and the longest, is nearly ten miles in length. In exploring that portion of the cave which we have endeavoured to describe, we walked thirty-five miles. We were lowest, beneath the surface of the earth, when upon the rivers, having then made a descent of three hundred and twenty-five feet. There are several large bodies of water in the cave, many springs, pure and sulphurous, and numerous cascades, of which "Harrison's Cascade" is the largest, falling the depth of sixty feet. The only salts in the cave, are the sulphates of magnesia and soda. The formations are principally of crystalized limestone, sulphate of lime, crystalized and fibrous gypsum, olophelite spar, and petrified mud.

In the winter season, great numbers of bats are found hanging to the ceiling in a state of torpor. A white semi-transparent, and *blind* species of cricket are occasionally seen; also, in the rivers, blind fish from three to five inches in length, perfectly white and transparent, together with craw fish, which possess the same peculiarities. We could discover, on examination, no place or sockets for the eyes, in either; on the contrary, the head was smooth on the top and sides, without the least inequality or indentation.

The air is agreeable and exhilarating, making the pulse beat full and strong, and respiration is performed with perfect freedom. The contrast, on emerging into the open air, is so great as almost to produce suffocation and fainting; the external air being loaded with a thousand disagreeable odors, and being heavy and feverish. This is caused by the extreme purity of the atmosphere within the cave, which is always, during both summer and winter, of about the same temperature, (60° Fahrenheit.) Hence the air within appears warm in winter and cool in summer. During the former season there is a constant current of air blowing *into* the cave, sufficiently strong to extinguish a lighted candle or lamp while in the summer, the current is reversed. This circulation is a preservation against *fire damp* of which there is none in the cave.

Lightning Rods.—Scientific Professors appear to be agreed that it is very important that lightning rods, in order to be efficient protectors, should terminate in moist earth, or which is better, in a pool of water. It would be but little trouble to dig a small pit, and supply it occasionally with water, in which the rod might terminate; and if to this is added two or three pounds of sulphate of iron, (copperas) once a year, the efficacy of the conductor would be still more perfect.

"Support your Local Newspapers," says the "Southern Miscellany." So say we; let every man first patronize one at least of the papers in his town, county or vicinity; but not content himself with one weekly paper only, but supply himself with three or four different papers. Unless a man is suffering extreme poverty, or ignorance of letters, it looks niggardly to neglect this important source of intelligence.

Correction.---Our readers are requested to re-examine our last paper, and correct the following errors, which occurred in consequence of our being absent. In the article on "The Wild Man of the Mountains," sixth line from bottom, for 'continues,' write 'contrives.' In last line of the second column, second page, for 'soul,' write 'cowl.' In the article on luminous ink, for 'especial oil,' write 'essential oil.' Under the head of the 'Art of Painting,' in the ninth line, for 'quirls,' write 'quirks.' In 35th line, for 'a thin oil,' write 'their oil.' In the fifth line of the article on colours, 'for average colour,' write 'orange colour.' While on the subject of errors, we may mention that in No. 4, in the article on Ærial Navigation, in one instance the words, 'two horse-powers,' occurs, instead of 'ten horse-powers.' Such errors are perplexing to editors, but cannot always be avoided.

More Favors.---We have now to acknowledge the receipt of a small pamphlet from our generous correspondent, S. R. Ford, of Newark, N. Y., in which he has evinced his taste by conspicuously marking a soft article about "soft light hair, and sparkling black eyes," &c. We have turned over every leaf in search of the expected *sixpence*, but—didn't find it.

Deep Water.---Experiments have been made lately to ascertain the depth of the Gulf Stream. A line has been sunk to the depth of a mile and a quarter, but without finding bottom. The experiments are to be renewed.

Christian Duties.

"He that hath my commandments and keepeth them," says the Son of God, "he it is that loveth me." Now it seems important that we should know what are the commands of Christ, which we are to observe and obey, in order to inherit the love of God. In looking over the New Testament, which evidently contains the whole of our Lord's commands, we find the following injunctions and intimations of duty, which are applicable to the present generation. Whoever neglects to obey them, is not a friend of Christ, and cannot see his face in peace, but is in danger of being rejected. His first command is, "Repent," which simply means to leave off sinning. "Blessed," said he, "are the poor in spirit (or humble); blessed are the meek; blessed are the merciful; blessed are the pure in heart; blessed are the peace-makers." He admits that the first and greatest commandment is, "Thou shalt love the Lord thy God with all thy heart, with all thy soul, and al thy strength, and with all thy mind:" but knowing that it is not in the power of a natural man to keep this commandment, he teaches a series of practical duties, the observance of which will lead us *directly to* the ability, to fulfil this great commandment. "Let your light so shine before men, that *they* may see your good works, and glorify your Father which is in heaven." Conceal not your faith nor your hope: but be ready to confess Christ before men. Be at peace with all; and if any person has any thing against you, go and passify him, and procure reconciliation. Abandon every thing in this world, even a right hand or a right eye, rather than offend God by sin. Swear not by any oath whatever. "Resist not evil;" but if any person injures, slanders or wrongs you in any way, do good to him in return. "Give to every one that asketh," and lend to him that would borrow; and that without hoping for any thing in return. If a man compels you to do any thing which is not sinful, do even more voluntarily than what you are compelled to do. "Love your enemies; bless them that curse you, and do good to them that hate you." Forgive freely and readily every one that injures or wrongs you. "Lay not up for yourselves treasures upon the earth; for where your treasure is, there will your heart be also." "Sell that ye have, and give alms." Be not anxious about things of this world, but believe that God careth for you and will provide. Take up your cross daily, (cross your natural inclination,) and follow Christ; that is, follow his example by doing good. Seek first the kingdom of God and his righteousness, and all things needful will be given you. Humble yourselves before God, and pray earnestly and frequently for all the blessings you need, especially for faith, wisdom, love, humility, and truth: and give thanks for divine favours. "Beware of the leaven of the scribes and pharisees:" beware of the bigotry and traditional superstition of a formal clergy, who teach for doctrines the commandments of men: but search the scriptures to learn what the will of the Lord is. "Abide in me; continue ye in my love." "Love one another as I have loved you." "Let love be without dissimulation: abhor that which is evil; cleave to that which is good." "Be kindly affectioned one to another with brotherly love; in honour, preferring one another." "Not slothful in business; fervent in spirit; rejoicing in hope; patient in tribulation; instant in prayer; given to hospitality; rejoice with them that do rejoice, and weep with them that weep: condescend to men of low estate; provide things honest in the sight of all men." "See that none render evil for evil unto any man, but ever follow that which is good." "Abstain from all appearance of evil." Is there any thing in all these injunctions, unreasonable, or inconsistent with our happiness here, or with good government regulations? Certainly not; but on the contrary, there is more peace and enjoyment, even in this world, in living in full obedience to the gospel rules, than in all the pleasures of wealth and luxury, with indulgence of sinful propensities.

Religious Intelligence.

A correspondent of the Edgefield (S. C.) Republican, gives intelligence of a protracted meeting, a Siloam Church, which continued sixteen days, during, or at the close of which, about forty persons were added to the church. A revival of religion is also reported to have occurred at Montgomery, Ala., during which 130 persons were added to the Methodist and Baptist churches. "This excitement," as the writer states, "is still continued by the Baptists:" thus leaving us to infer that the *excitement* is over with the Methodists, that church having received most of the converts; but that the Baptists were not yet satisfied with their share. We are glad to hear of reformations, but cannot think very highly of the assiduity with which reclaimed persons are gathered into the churches.

Prepare to Die, is a common-place injunction; and a preparation for death, is mentioned as an important duty, by modern church members. But we do not like the sentiment. We consider that mankind are naturally in a state of preparation for death; and what is now important, is, a preparation for life. "He that liveth and believeth—shall never die."

Another Line.—A line of telegraphs between New-York and the eastern end of Long Island, is in progress. This line is calculated for shipping intelligence, but may be readily extended across the Sound toward Boston by two *conspicuous* stations.

The Morning Courier, is the title of a sprightly and interesting little *penny daily* paper, published at Indianapolis, Ia., by W. Thompson Hatch. We hope it will be liberally patronized.

It is said that drunken men have a great affinity for railroad tracks. One of them was nearly cut in two by the cars on the railroad near Geneva, a few days since.

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Most numerous are the inventions lost to the world for ages, and many doubtless to this day, because the inventors, being poor, could not bring them out. To remedy this evil to some extent, the following plan is suggested.

RARE PROJECT.

G PECK & CO. having, and being offered, several new inventions, worthy to be tested and brought out, present to the public the following liberal offers.

One invention promises great usefulness to most cities, villages, and farmers; one, great aid to agriculture. One, greater safety and cheapness to rail-road conveyance; one a great saving of expense, time and toil in education, &c.

They require means to bring them into use. If many will furnish each a little the burden will be light—the success almost certain, and the advantage the greater; and this advantage the inventors will gladly share with the helpers. Incurring much expense, and risking much themselves, it cannot be presuming too much to trust that an intelligent public will see it to be liberal, and wise to risk a little and invest the small sum proposed on the terms here offered.

It is little any can lose if he were to get no return, while we must lose far more, even for advertising, if none accept our offers. But they will have some return, and may much gain. Let then each send us his name and $2, or 25 cents weekly for ten weeks, and secure the advantages of these inventions.

We add one other consideration. Had Fitch, who first applied steam to propel a boat, and was the real first inventor of steam boats, received a little aid, steam boats would have been in operation more than 50 years ago, and our country would have had the undisputed honor of the invention. But he exhausted his means—none would help—and though he knew it was worth millions, he died in poverty, and our country was the loser for a half century.

WORTHY ATTENTION.

A share or town right of a valuable patent—50 or 100 acres of good farming land; $2, $30, or $85 cash; a copy of the circular interest tables, or a useful Essay, to be had on easy terms.

The patent share will be sent to any one who sends us $2, or 25 cents weekly for ten weeks, which share will be worth $5 or more.

The town right will be his who procures 25 share subscribers and sends us the money. The 50 acres his who sends us the money for 150 subscribers within three months. The 100 acres his who sends us for 300 in four months. The $2 his who sends us the $2 each for 12 subscribers in 2 months. $30 his who sends for 100 in 3 months, $85 his who sends for 250 in 6 months. The interest tables or Essay shall be his who sends us immediately the names of each waggon, carriage, plough or harness maker, of each farmer who keeps bees or silk worms, of owners of furnaces or forges, of each physician, minister, teacher, miller, tanner and merchant of the village or town where he lives, twenty-five names or more; and also a share of the patent right if he sends 25 or more names and 25 cents cash within one month.

The patent share to each of those who pay $2 within 8 weeks from next September 1, or before, will embrace three inventions; to those who pay in the next 5 weeks, two inventions; and but one to others, and not this unless cash is received in 4 months, unless we choose. The essay or tables will also be his who pays before September 20th. What we desire is speedy work—hence these large premiums. Most important inventions will thus be secured, and a profitable share to each.

We also offer to any one who will send us $10, $30, $75 or $125, to give him 3, 9, 27 or 54 shares one-third in each of three inventions, or a town right of one, two or three of the patents, and a privilege to sell rights, at great profit; and he may commence at once. We can give good business of this kind now. If our project meets with the favor we expect we shall be able to give a great deal of business of this kind, and thus greatly promote enterprize and industry. We have the best machine to clean wheat of smut, garlic, &c.; price $75. Over 70 have been put in operation in one county in Pennsylvania. We have also the best cultivator for tilling corn and putting in wheat and rye, from $6 to $15. Also the neatest, handiest and swiftest straw cutter of its size, for $12. Office for orders at room 13, 25 Pine street, next to the Custom House.

The inventions will be of different values, and will be put into such number of shares as will make each share worth $5 or more. We will dispose of the rights, keep the accounts, and pay to share holders the dividends. We shall also from time to time, quarterly or oftener, send them a paper giving them a full account of the inventions, as far as it will be best to publish it. We shall send them the first in September. Let it announce that subscribers are already in to secure the whole project. It will not fail if no more subscribe than we already have. We can do a little, and each who helps will aid us to do more; thus none will lose, but if many help, the better will it be to each. One of the most promising inventions will be very costly to start. We want 10,000 subscribers for it: but it will be worth ten times the cost; and it is certain of success, it has been so far tested. The others are very excellent in promise.

The inventions are very important; the land good in this State or in Pennsylvania; the Tables useful, and the Essay on a subject of deep interest to all; and the periodical we shall occasionally send, free of charge, will be of general interest to farmers, mechanics, patentees, physicians, ministers, and owners of minerals, and to all.

It is thus the interest of all to push this project. Let then each improve this offer at once, and have the satisfaction of aiding to bring out great inventions that promise vast benefit to mankind, and good profit to the helpers, as well as timely aid to some worthy inventors, who are struggling with poverty, whom we greatly desire to aid. Now is the WORD! Now or never. If QUICKLY done, it will be DONE and WELL done, and a GOOD THING done.

It will be easy for two or more to unite, write their names in a letter, put in the money, and direct to G. Peck & Co., New York. The mail will bring it safe, or we will risk it, and pay the postage.

New York, August, 1845. G. PECK & CO.

Editors who will notice this rare project and advertise it, will promote a great public good, and shall share liberally in the advantage they promote. For 13 insertions of the project in full, they shall receive 5 of the three right shares.

Besides the guarantee, which the expense we have already incurred for patents, models, machines, advertising, &c. to make these proposals, gives, to warrant confidence at least to the little extent we ask, we are favored with the following certificate, signed by Hon. R. H. Morris, late mayor and present post-master, and by Hon. F. A. Tallmadge, the present recorder of New York:—

"Messrs. G. Peck & Co. wishing the public to favor their business, this certifies, that, from our personal acquaintance we are assured that confidence in their proposals will not be misplaced.

ROBT. H. MORRIS,
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☞ All our travelling and city agents will have receipts to give, signed by us. Postmasters, Editors, and others, acting as local agents, in towns and villages where they are known, will give their own receipts, which will be duly acknowledged by G. Peck & Co.

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THE EIGHTEENTH GREAT FAIR OF THE AMERICAN INSTITUTE at NIBLO'S GARDEN, New-York.—The Fair will open on Monday, the 6th of October next, at 12 o'clock, M. The days for delivering articles at the Garden, THURSDAY, FRIDAY and SATURDAY previous. The National Convention of Farmers, Gardeners, and Silk Culturists, will be held on Thursday, 9th October. Delegates, without further notice, are invited from all parts of the Union. The Cattle Show will be held on the ground between 23d and 24th streets, 5th Avenue. Ploughing and Spading Matches, &c., as usual. Head Quarters for Managers, Committees, &c., secured in the Madison Cottage. Fine horses for draft, healthy fat cattle, and sheep for market, well matched and trained working cattle, and new and useful inventions, will command higher premiums than at any preceding Fair. An opening, anniversary, &c. Addresses will be delivered by the most eminent orators of our country. The people of this great Republic are invoked zealously to co-operate in carrying out this exhibition. au23

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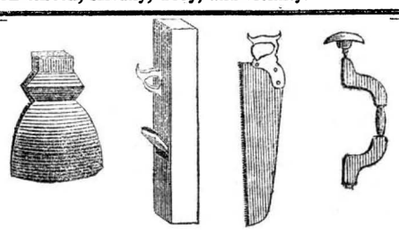

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